Huiran Yu

+1 (412)-953-5602 | hyu56@ur.rochester.edu
https://ella-granger.github.io/

EDUCATION

University of Rochester Aug 2023 - Jun 2028
Ph.D in Electrical and Computer Engineering Rochester, NY
Research area: Automatic Music Transcription, Controllable Voice Conversion

Carnegie Mellon University Aug 2020 - Dec 2022
M.S. in Computer Science Pittsburgh, PA
Related Courses: Machine Learning, Distributed Systems, Introduction to Computer Music

Tsinghua University Aug 2016 - Jun 2020
B. E. in Computer Science and Technology Beijing, China
Related Courses: Data Structure, Software Engineering, Computer Architecture, Operating Systems

Tsinghua University Sep 2017 - Jun 2020
Minor in Music Engineering and Technology Beijing, China
Related Courses: Harmonic, Composition, Recording, Digital Music Production

PUBLICATIONS

- **H. Yu** and Z. Duan, Note-Level Transcription of Choral Music, *in Proceedings of the 25th International Society of Music Information Retrieval Conference*, San Francisco, CA, 2024. [link]
- S. Dai, **H. Yu**, and R. B. Dannenberg, What is missing in deep music generation? A study of repetition and structure in popular music, *in Proceedings of the 22nd International Society for Music Information Retrieval Conference*, Bengaluru, India, 2022. [arXiv]
- X. Zhuang, **H. Yu**, W. Zhao, T. Jiang, and P. Hu, KaraTuner: Towards end-to-end natural pitch correction for singing voice in karaoke, *in Proceedings of INTERSPEECH*, Incheon, South Korea, 2022. [arXiv]

PROFESSIONAL EXPERIENCE

Tiktok Inc. Jan 2023 - Jun 2023
Research Intern Speech, Audio and Music Intelligence Group San Jose, CA

- Enhanced symbolic music generation system by integrating a Variable-Order Markov Model, enabling precise control over surprise and expectation levels in generated melodies, resulting in improved human evaluation scores.
- Collaborated with the engineering team to implement the symbolic music generation system into Ripple, ensuring seamless integration and low RTF to achieve a smooth user experience.
- Applied large language models (LLMs) to conditional symbolic music generation, producing contextually appropriate melodies based on predefined chord progressions and rhythm patterns.

Tiktok Inc. May 2022 - Aug 2022
Research Intern Speech, Audio and Music Intelligence Group Seattle, WA

- Developed a symbolic melody generation system based on recent research, which is conditioned on rhythm and chord information to reach fine-grained control of the generated content
- Cooperated music domain-knowledge into the system to improve the stability of the generation result
- Aggregated several MIR systems to transcribe melody, chord and other features from audio to enlarge training data for generation model

Tencent Music Entertainment Mar 2021 - Sep 2021
Research Intern TME Lyra Lab Shenzhen, Guangdong, China

- Developed a feed-forward neural pitch curve generation system to improve naturalness of singing voice synthesis task; incorporated adversarial training to solve over-smoothing
- Built an end-to-end Autotuning system to correct out-of-tune singings for WeSing application; personalized outcome with vocal spectrum information of each user to avoid homogenous singing style
- Implemented a lyric synchronization framework for WeSing based on large scale user-generated content and force alignment, which reduced the time stamp offset to lower than 50ms on average

PROJECT EXPERIENCE

Choral Music Transcription Sep 2023 - Present

Advisor: Zhiyao Duan University of Rochester

- Curated an a Cappella dataset YouChorale for choral music transcription, which includes 452 recordings of 261 compositions from 118 composers, representing a wide range of periods, styles, and complexities inherent to choral music
- Proposed a new end-to-end note-level music transcription framework which skips the frame-level processing and directly produces the note event sequence
- Trained on YouChorale, our proposed model achieves state-of-the-art performance in choral music transcription, marking a significant advancement in the field

Music Structure: finding internal connections for music generation Jan 2022 - Dec 2022

Advisor: Roger B. Dannenberg Carnegie Mellon University

- Implemented the framework to test the different model capabilities and dataset predictabilities in music generation using Variable-Order Markov Model
- Extracted structure and repetition features from music by data-driven approach, and analyzed the effect of song-specific information and the general statics in the dataset on the music prediction task
- The results suggested our approach can be used as a metric to evaluate the quality of deep-network-generated music

A Comparison Between Encoders in Image Captioning Jan 2020 - Jun 2020

Advisor: Jianmin Li Tsinghua University

- Replaced traditional ResNet and Faster R-CNN encoders in image caption models with EfficientNet to extract features from images, which showed that a strong classification backbone network can also encode high-complexity latent semantic
- Reached CIDEr metric of 137.1, which is 10% higher compared to SOTA, with EfficientNet as the encoder and transformer as the decoder

A Polyphonic MIDI Computer Accompaniment System Jul 2019 - Sep 2019

Advisor: Roger B. Dannenberg Carnegie Mellon University

- Implemented a robust polyphonic midi computer accompaniment system [link] based on Carnegie Mellon University Human Computer Music Performance system and previous technics from Roger Dannenberg and Josh Bloch
- Improved dynamic matching algorithm by incorporating time stamp features
- Adjusted time scheduler in the system to nested scheduler which guaranteed the efficiency of time map computing and score display at the same time

SKILLS

- Programming Languages: C++, Python, Java, golang, Matlab
- Frameworks: Pytorch, Tensorflow
- Music Production: Sibelius, Cubase, ProTools
- Interests: Piano, Opera Singing

ACTIVITIES

- Secretary, Student Association of Science and Technology, Computer Science and Technology dpt., Tsinghua University, 2017-2018
- Secretary, Publicity Department of Student Union, Computer Science and Technology dpt., Tsinghua University, 2017-2018
- Captain, Woman Volleyball Team, Computer Science and Technology dpt., Tsinghua University, 2018-2019
- Soprano, Beijing Philharmonic Choir, Conductor: Prof. Hongnian Yang, 2007-2014
- Soprano, Eastman-Rochester Chorus, Conductor: Prof. William Weinert, 2024-Now